

CLAIMS

1. A method of estimating the location of a mobile device, comprising the steps of:

5 collecting location information;

selecting at least one of a plurality of different location methods to provide a location estimate; and

providing a location estimate based on the at least one selected location method.

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2. A method as claimed in claim 1 wherein said at least one location method comprises at least one of the following methods:

a method using cell identity information;

a method using cell identity information and received signal strength;

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a method using cell identity information and timing advance information; and

a method using cell identity information, received signal strength information and timing advance information.

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3. A method as claimed in claim 1 or 2, comprising the step of determining a virtual base station estimate.

4. A method as claimed in claim 3 when appended to claim 2, wherein said virtual base station estimate is determined using at least one of the methods of claim 2.

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5. A method as claimed in claim 3 or 4, wherein said virtual base station location estimate coupled with at least one virtual measurement and at least one real measurement and said at least one virtual measurement is processed using a location method.

22. A method as claimed in any preceding claim, wherein a location estimate is provided using an algorithm solving the following equation in x and y:

$$\begin{cases} \sum_{i=1}^N \left[-\frac{\mathcal{I}_i}{|\mathbf{R}|} (x - x^i) - \frac{(\tilde{\mathcal{I}}_i - 1)}{|\mathbf{R}|} \{ (x^i)^2 x - x^i y^i (y - y^i) \} \right] = 0 \\ \sum_{i=1}^N \left[-\frac{\mathcal{I}_i}{|\mathbf{R}|} (y - y^i) - \frac{(\tilde{\mathcal{I}}_i - 1)}{|\mathbf{R}|} \{ (y^i)^2 y - x^i y^i (x - x^i) \} \right] = 0 \end{cases} ; (x, y) \in \mathcal{D}$$

5 23. A method as claimed in any preceding claim, wherein a location estimate is provided using an algorithm based on the following equation:

$$\hat{x} = \frac{\sum_{i=1}^N \frac{x^i}{\mathcal{I}_{i0}}}{\sum_{i=1}^N \frac{1}{\mathcal{I}_{i0}}} ; \hat{y} = \frac{\sum_{i=1}^N \frac{y^i}{\mathcal{I}_{i0}}}{\sum_{i=1}^N \frac{1}{\mathcal{I}_{i0}}} ; (\hat{x}, \hat{y}) \in \mathcal{D}$$

24. A method as claimed in any preceding claim, wherein said location estimate is provided by one of a iterative and a closed form method.

25. A method as claimed in any preceding claim, wherein said location estimate is provided by one of a linear and non linear method.

15 26. A system for estimating the location of a mobile device, comprising:
means for collecting location information;
means for selecting at least one of a plurality of different location methods to provide a location estimate; and
means for providing a location estimate based on the at least one selected
20 location method.